58. (NEW) A nucleic acid oligomer modified by attaching a catalytically redox-active moiety, characterized in that the catalytically redox-active moiety selected from the group consisting of native or modified alcohol dehydrogenase, native or modified fructose dehydrogenase, native or modified lactate dehydrogenase, and native or modified peroxidases..

59. (NEW) The modified nucleic acid oligomer according to claim 58, wherein the catalytically redox-active moiety is covalently attached.

60. (NEW) The modified nucleic acid oligomer according claim 58, wherein the modified nucleic acid oligomer and sequence-specifically bind single-strand DNA, RNA, or PNA.

61. (NEW) The modified nucleic acid oligomer according to claim 60, wherein the modified nucleic acid oligomer is a deoxyribonucleic acid oligomer, a ribonucleic acid oligomer, or a peptide nucleic acid oligomer.

62. (NEW) The modified nucleic acid oligomer according to claim 58, wherein, alternatively, the catalytically redox-active moiety is covalently bound to one of the phosphoric-acid, carboxylic-acid, or amine groups, or to a sugar of the nucleic acid oligomer backbone.

63. (NEW) The modified nucleic acid oligomer according to claim 58, wherein, following attachment to the nucleic acid oligomer, the catalytically redox-active moiety possesses catalytic activity.

64. (NEW) The modified nucleic acid oligomer according to claim 58, wherein, following attachment to the nucleic acid oligomer, the catalytically redox-active moiety possesses electrocatalytic activity.

65. (NEW) The modified nucleic acid oligomer according to claim 58, wherein multiple catalytically redox-active moieties are attached to the nucleic acid oligomer.

66. (NEW) The method of producing a modified nucleic acid oligomer according to claim 58, wherein a catalytically redox-active moiety is covalently attached to a nucleic acid oligomer.

67. (NEW) The method of producing a modified nucleic acid oligomer according to claim 66, wherein, alternatively, the nucleic acid oligomer is bound to the catalytically redox-active moiety by one or more amidations with amine or acid groups of the catalytically redox-active moiety, by one or more esterifications with alcohol or acid

groups of the catalytically redox-active moiety, by thioester formation with thioalcohol or acid groups of the catalytically redox-active moiety, or by condensation of one or more amine groups of the nucleic acid oligomer with aldehyde groups of the catalytically redox-active moiety and subsequent reduction of the resultant carbon-nitrogen double bond.

68. (NEW) The method of producing a modified nucleic acid oligomer according to claim 66, wherein one or more branched or linear molecular moieties of any composition and chain length are covalently attached to the catalytically redox-active moiety and the branched or linear molecular moieties possess, alternatively, a reactive amine, hydroxyl, thiol, acid, or aldehyde group for covalent attachment to a nucleic acid oligomer.

69. (NEW) The method of producing a modified nucleic acid oligomer according to claim 68, wherein the shortest continuous link between the nucleic acid oligomer and the catalytically redox-active moiety is a branched or linear molecular moiety having a chain length of 1-20 atoms..

70. (NEW) A modified conductive surface, wherein one or more types of modified nucleic acid oligomers according to claim 58 are attached to a conductive surface.

71. (NEW) The modified conductive surface according to claim 70, wherein the surface consists of a metal or a metal alloy.

72. (NEW) The modified conductive surface according to claim 70, wherein the surface consists of a semiconductor.

73. (NEW) The modified conductive surface according to claim 70, wherein the surface consists of a binary compound of the elements of groups 14 and 16, a binary compound of the elements of groups 13 and 15, a binary compound of the elements of groups 15 and 16, or a binary compound of the elements of groups 11 and 17.

74. (NEW) The modified conductive surface according to claim 70, wherein the surface consists of a ternary compound of the elements of groups 11, 13, and 16, or a ternary compound of the elements of groups 12, 13, and 16.

75. (NEW) The modified conductive surface according to claim 70, wherein the attachment of the modified nucleic acid oligomers to the conductive surface occurs covalently or by chemisorption or physisorption.

76. (NEW) The modified conductive surface according to claim 70, wherein, alternatively, one of the phosphoric-acid, carboxylic-acid, or amine groups, or a sugar group, of the nucleic acid oligomer backbone, is attached, covalently or by chemisorption or physisorption, to the conductive surface.

77. (NEW) The modified conductive surface according to claim 70, wherein, alternatively, a thiol, hydroxyl, carboxylic-acid, or amine group of a modified base of the nucleic acid oligomer is attached, covalently or by chemisorption or physisorption, to the conductive surface.

78. (NEW) The modified conductive surface according to claim 70, wherein only one type of modified nucleic acid oligomer each is attached in a spatially delimited area of the conductive surface.

79. (NEW) A method of producing a modified conductive surface as defined in claim 70, wherein one or more types of modified nucleic acid oligomers are applied to a conductive surface.

80. (NEW) The method of producing a modified conductive surface according to claim 70, wherein one or more types of nucleic acid oligomers are applied to a conductive surface and, thereafter, a modification of the nucleic acid oligomers is carried out.

81. (NEW) The method of producing a modified conductive surface according to claim 79, wherein the nucleic acid oligomers or the modified nucleic acid oligomers are hybridized with the respective complementary nucleic acid oligomer strand and applied to the conductive surface in the form of the double-strand hybrid.

82. (NEW) The method of producing a modified conductive surface according to claim 79, wherein the nucleic acid oligomer or the modified nucleic acid oligomer is applied to the conductive surface in the presence of further chemical compounds that are likewise attached to the conductive surface.

83. (NEW) A method of electrochemically detecting oligomer hybridization events, wherein one or more modified conductive surfaces as defined in claim 70 are brought into contact with nucleic acid oligomers and, subsequently, detection of the electrical communication between the catalytically redox-active moiety and the respective conductive surface takes place.

84. (NEW) The method according to claim 83, wherein detection takes place by cyclic voltammetry, amperometry, potentiometry, or conductivity measurement.

85. (NEW) The method of electrochemical detection according to claim 83, wherein electrochemical detection is initiated by adding the substrate to the catalytically redox-active moiety attached to the conductive surface via a nucleic acid oligomer.

86. (NEW) The method according to claim 85, wherein the addition of the substrate to the catalytically redox-active moiety attached to the conductive surface via a nucleic acid oligomer is limited to an area of the conductive surface having one or more modified nucleic acid oligomer types.